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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/765,123
Filing Date: January 28, 2004
Appellant(s): HOLZSCHUH ET AL.

Robert A. Madsen
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 18, 2008 appealing from the Office action mailed January 18, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

The 35 U.S.C. 112, second paragraph rejection of claim 21, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been withdrawn and thus is not presented for appeal.

The 103(a) rejection of claim 19 as being unpatentable over Gruhl (US 4992404) and Lepez (FR 2775621) as translated by the USPTO on July 2007 has been withdrawn and thus is not presented for appeal.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,876,108	UNDERWOOD et al	10-1989
3,012,124	WEISSMAN	12-1961
3,875,314	WISTREICH et al	4-1975
4,992,404	GRUHL et al	2-1991
FR 2,775,621*	LEPEZ et al	09-1999

*As translated by the USPTO 7-2007, pages 1-17

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 4, 6-15, 18-21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood et al (US 4876108) in view of the combination of Lepez (FR 2775621) as translated by the USPTO July 2007 and Weissman (US 3012124).

Underwood et al (Underwood) teaches of a process for the production of a smoke product, being obtained by pyrolysis of an organic material (abstract and column 3 lines 11-17), wherein said process comprises the steps of:

-preheating the organic material by drying (Column 1 lines 55-57, Column 9 lines 8-11, and Example 2, Column 11 lines 26-29)

-introducing the dried organic material to be pyrolyzed in a pyrolysis reactor (Example 2, Column 11 lines 33-35)

-heating the dried organic material in a chamber to a temperature of between 400C and 650C to pyrolyze the organic material (Column 3 lines 58-64 and Example 2, Column 11 lines 5, 6, and 36-52), and

-removing the consumed organic material and recovering the produced liquid smoke (Column 3 lines 67 and 68, Column 4 lines 10-22, and Example 2, Column 11 lines 53-65).

Underwood teaches that the organic material is inserted at the beginning of the heatable chamber and is heated in an oxygen starved atmosphere, thus teaching that the organic material was in a substantially hermetically sealed heatable chamber (abstract and Column 8 line 31 through Column 9 line 7). Underwood teaches that the smoke is condensed at the outlet of the reactor in a condensation device (Column 9 lines 3-7 and Figure 1 item #25). Underwood teaches that the organic material is essentially constituted by wood chips and that the consumed organic material collected is wood charcoal (abstract, Column 9 lines 8-11, and Column 11 lines 1-2 and 53-55). Underwood discloses that the liquid smoke product comprises a benzopyrene content of between 5 and 50ppb (Column 5 lines 32-33) and that levels below 0.5ppb were achieved (Column 5 lines 50-51). Underwood teaches that the liquid smoke was diluted to lower the level of carcinogenic, such as benzopyrene (Column 2 lines 61-65 and Column 4 lines 10-21 and 27-40). Underwood teaches that the pyrolysis reactor includes a heating and mixing device wherein the heat is provided from an external source (Column 8 lines 3-28 and Figure 1 items 1 and 10). Underwood teaches that foodstuff was smoked with the produced liquid smoke (abstract and Column 1 lines 5-9).

Specifically regarding the pyrolysis reaction as occurring between 300C and 400C as recited in claims 1, 18, and 19, Underwood teaches that the pyrolysis reaction occurs between 400C and 650C, which includes 400C and thus encompasses the end point of the range 300-400C as instantly claimed (Abstract and Column 8 lines 50-55). Note: The phrase "between 300C and 400C" is interpreted as the range of 300-400C.

Furthermore, to adjust the pyrolysis temperature such a small amount, i.e. from 400C to 399.9C, would have been obvious and routine determination of one of ordinary skill in the art at the time the invention was made based upon the specific material being pyrolyzed and the optimal operating conditions. Slight temperature adjustments in processing were routine and as such, a temperature adjustment of less than 1C would not impart a patentable distinction to the claims in the absence of criticality or unexpected results.

Underwood is silent to the pyrolysis reactor as comprising a rotatable heated endless screw with a heating device to supply calories to elevate the temperature of the organic material as recited in claims 1, 10, 18, and 19, to precise control of the environmental factors, including oxygen and temperature control, when the pyrolysis occurs as recited in claims 6, 7, and 23, to the heating device of the screw as operating by the Joule effect and passing electrical current through the screw as recited in claims 10, 18 and 19, and to the liquid smoke as comprising a benzoanthracene content of 20ppb or less as recited in claims 13 and 19.

Weissman teaches a smoke generator for generating smoke from hard wood chips (Column 1 lines 8-10). Weismann teaches that the smoke generator includes a trough of acruate having a charging end into which wood chips are fed and a discharging end from which the chip residue is discharged, wherein the trough is heated by electrical resistance elements and an Archmedean screw i.e. an endless screw is supported rotatably within the trough to advance wood chips from the charging end to the discharging end (Column 1 lines 11-19, Column 3 lines 5-7, and Figure 3). Weismann teaches that the screw and heating arrangement increases the operating efficiency of the smoke generator (Column 1 lines 22-25).

Lepez teaches of an improved heating and mixing apparatus (page 1 paragraph 1). Lepez teaches that the combined device eliminates the need for an onerous bulky system (page 1 paragraphs 3 and 4). Lepez teaches that the heating device is comprised of the mixing member in contact with the process material for the most part of the mixing process and that all or nearly all of the process material will be heated directly by the heating device (Page 5 paragraph 2). Lepez teaches that the mixer is

comprised of electrically conducting material, including metal, and that the mixer is shaped as a screw, and that an electric current is brought from a supply source to the mixing member causing heating by the Joule effect (Page 6 paragraph 4, Page 7 paragraph 3, Page 8 paragraph 1, Page 9 all, Page 10 paragraph 3, and Figures 1 and 2 specifically items 5.1 and 5.3).

Regarding the smoke forming apparatus as a rotatable heated endless screw comprising a heating device, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a rotatable endless screw, for mixing in the smoke forming process as taught by Underwood in view of Weissman. One would have been motivated to use a rotatable endless screw because the screw systems provides increased operating efficiency as taught by Weissman. It would have been further obvious to one of ordinary skill in the art at the time the invention was made for the screw to be heated, wherein the screw comprises an electrical heating device that utilizes the Joule effect and passes electric current through the screw. One would have been motivated to do so because a screw which heats and mixes the screw by utilizing the Joule effect and passing electric current through the screw, provides for a less bulky and onerous system as taught by Lepez. The heated endless rotatable screw as taught by Underwood in view of Weismann and Lepez would supply calories to elevate the temperature of the organic material and move the organic material by rotation through the heatable chamber. The organic material would be introduced at one end of the reactor or screw and removed at the other end of the screw or reactor as taught by Underwood (Column 8 lines 50-53, Column 9 lines 3-7, and Figure 1 items #6 and #25). Furthermore, one would have been motivated to insert the material to be reacted at the beginning of the reactor, i.e. the screw, and recover the material at the end of the reactor, i.e. the screw, so that the material would be fully reacted.

Regarding precise control of the environmental factors, including oxygen and temperature control, when pyrolysis occurs, it would be obvious to one of ordinary skill in the art at the time the invention was made to maintain precise environmental control during the pyrolysis reaction, including precise control over the gas environment and temperature, in order to optimize the process and produce a suitable liquid product.

One would have been further motivated to do so to prevent adverse reactions, such as the formation of excess carcinogenic materials or to prevent combustion of the wood particles while heated to elevated temperature.

Regarding a benzoanthracene content of 20ppb or less, benzoanthracene was a well-known carcinogen to humans; Underwood teaches of diluting the final condensed product so that it contains less than the accepted levels of known carcinogenic (Column 2 lines 61-65, Column 4 lines 10-21 and 27-40, and Column 9 lines 12-13); thus it would be obvious to one of ordinary skill in the art at the time the invention was made to expect a low content of benzoanthracene as recited by applicant. Further, one would have been motivated to reduce the benzoanthracene and other carcinogenic levels as low as possible without damaging the final product in order to prevent the product from harming consumers. Furthermore, as admitted by applicant, specification page 3 lines 8-11, the standards at the time the invention was made in Europe require for a maximum quantity of 20ppb of benzoanthracene in liquid smoke, thus one of ordinary skill in the art at the time the invention was made would have been motivated for the liquid smoke to contain less than 20ppb in order to comply with European requirements.

Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood et al (US 4876108) in view of the combination of Lepez (FR 2775621) as translated by the USPTO July 2007 and Weissman (US 3012124) further in view of Wistreich et al (US 3875314).

Underwood teaches of a pyrolysis method in which the pyrolysis gas is condensed in a condensation device as discussed above. Underwood is silent to re-injecting the condensed gas back into the reactor as recited in claims 5 and 22.

Wistreich et al (Wistreich) teach a liquid smoke and method for manufacture comprising feeding wood through an enclosed space heated to a temperature sufficient to cause thermal destruction or degradation of the wood particles (Abstract, Column 1 lines 2-7, and Column 2 lines 37-54). Wistreich teaches that the fumes, vapors and smoke particles which are given off by the thermal reduction of wood particles are exhausted from the reaction chamber through an outlet for passage into a condensate

chamber (Column 2 lines 56-60). Wistreich teaches that it is desirable to mount the condenser in communication with and preferably at the top of the reactor for continuous flow of vapors and gases exhausted from the top of the reactor to the inlet of the condenser so that the vapors are recycled and the yield of materials extracted is enhanced (Column 3 lines 23-43).

Regarding re-injecting pyrolysis gas into the reactor, it would be obvious to one of ordinary skill in the art to modify Underwood by recirculating the pyrolysis vapors and gases into the reactor in order to enhance yield as taught by Wistreich.

Claims 1, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruhl (US 4992404) in view of Lepez (FR 2775621) as translated by the USPTO July 2007.

Gruhl teaches a pyrolysis process of an organic material with a screw conveyor at a temperature of 200-800C. Gruhl teaches the process produces volatile products, i.e. smoke products, and organic residue. Refer specifically to Column 2 lines 8-36.

Specifically regarding the organic material as introduced at one end of the screw and recovered at the other end of the screw, one of ordinary skill in the art at the time the invention was made would expect that Gruel inherently teaches of inserting material to be reacted at the beginning of a reactor, i.e. the screw, and recovering the material at the end of the reactor, i.e. the screw. Furthermore, one would have been motivated to insert the material to be reacted at the beginning of a reactor, i.e. the screw, and recover the material at the end of the reactor, i.e. the screw, so that the material would be fully reacted.

Gruhl is silent to the screw conveyor as substantially hermetically sealed as recited in claims 1, 17, and 18, and to the screw conveyor as a rotatable heated endless screw comprising a heating device as recited in claims 1, 17, and 18.

Lepez teaches of an improved heating and mixing apparatus (page 1 paragraph 1). Lepez teaches that the combined device eliminates the need for an onerous bulky system (page 1 paragraphs 3 and 4). Lepez teaches that the heating device is comprised of the mixing member in contact with the process material for the most part

of the mixing process and that all or nearly all of the process material will be heated directly by the heating device (Page 5 paragraph 2). Lepez teaches that the mixer is comprised of electrically conducting material, including metal, and that the mixer is shaped as a screw, and that an electric current is brought from a supply source to the mixing member causing heating by the Joule effect (Page 6 paragraph 4, Page 7 paragraph 3, Page 8 paragraph 1, Page 9 all, Page 10 paragraph 3, and Figures 1 and 2 specifically items 5.1 and 5.3).

Regarding the pyrolysis reactor as substantially hermetically sealed, Gruhl teaches that the heating of the organic material forms volatile products. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substantially hermetically seal the pyrolysis reactor or the screw conveyor in order to prevent the escape of the volatile products formed during the heating process. To do so would be within the ordinary ingenuity of one of ordinary skill in the art at the time the invention was made.

Regarding a rotatable heated endless screw which comprising a heating device, it would have been obvious to one of ordinary skill in the art to utilize a rotatable heated endless screw comprising an electrical heating device that uses the Joule effect and passes electric current through the screw in the pyrolysis process as taught by Gruhl in view of Lepez. One would have been motivated to do so because the Joule heated rotatable screw system provides for a less bulky and onerous system as taught by Lepez.

(10) Response to Argument

Applicant's arguments, see Brief pages 8-9, filed August 18, 2008, with respect to the 35 U.S.C. second paragraph rejection of claim 21 have been fully considered and are persuasive. The to the 35 U.S.C. second paragraph rejection of claim 21 has been withdrawn, as stated above.

Applicant's arguments filed August 18, 2008 regarding the rejection of claims 1, 2, 4, 6-15, 18-21, 23, and 24 under 35 U.S.C. 103(a) as being unpatentable over

Underwood et al (US 4876108) in view of the combination of Lepez (FR 2775621) as translated by the USPTO July 2007 and Weissman (US 3012124) have been fully considered but they are not persuasive (Brief pages 9-17).

Applicant argues that Underwood does not teach of heating between 300C and 400C as recited in claims 1, 18, and 19. Applicant's argument is not convincing as Underwood teaches that the pyrolysis reaction occurs between 400C and 650C, which includes 400C and thus encompasses the end point of the range 300-400C as instantly claimed (Underwood Abstract and Column 8 lines 50-55). Note: The phrase "between 300C and 400C" is interpreted as the range of 300-400C. Furthermore, to adjust the pyrolysis temperature such a small amount, i.e. from 400C to 399.9C, would have been obvious and routine determination of one of ordinary skill in the art at the time the invention was made based upon the specific material being pyrolyzed and the optimal operating conditions. Slight temperature adjustments in processing were routine and as such, a temperature adjustment of less than 1C would not impart a patentable distinction to the claims in the absence of criticality or unexpected results.

Applicant argues that Underwood does not teach of introducing material at one end of the screw, while removing both the consumed material and recovering smoke at the other end of the screw. Applicant's argument is not convincing as Underwood teaches that the organic materials were introduced at one end of the reactor and the products, including smoke and consumed materials, were removed at the other end of the reactor (Column 8 lines 50-53, Column 9 lines 3-7, and Figure 1 items #6 and #25); as one would have been motivated to use a rotatable endless screw as the pyrolysis reactor of Underwood because the screw systems provides increased operating efficiency as taught by Weissman; thus in the process taught by Underwood in view of Weismann the organic materials were introduced at one end of the reactor or screw and the products, including smoke and consumed materials, were removed at the other end of the reactor or screw. Furthermore, one would have been motivated to insert the material to be reacted at the beginning of a reactor and recover the material at the end of the reactor, so that the material would be fully reacted.

Applicant argues that the proposed combination of references would destroy the intended purpose of Underwood and would not be capable of use with the method of Underwood because Underwood discloses fast pyrolysis for smoke generation in an oxygen starved environment at a temperature of at least 400C; Weismann teaches a method of smoke generation at temperatures below about 149C; and Lepez teaches of an apparatus for drying and roasting, which includes plastic materials, thus suggesting only low temperature treatments.

Applicant's argument regarding Weismann is not convincing as Weismann teaches of a method of smoke generation at temperatures below about 149C (Column 1 lines 53-67 and Column 5 lines 24-35); there is nothing disclosed or suggested by Weismann to indicate that the smoke producing apparatus or screw could not be used or would not work at higher temperatures; and one of ordinary skill in the art at the time the invention was made would have been motivated to use a rotatable endless screw for smoke production from wood as taught by Weismann in process of smoke production from wood taught by Underwood, because Weismann teaches that the apparatus, i.e. the screw system, provides increased operating efficiency.

Applicant's argument regarding Lepez is not convincing as Lepez teaches of an improved apparatus for mixing and heating solid products in an enclosure (page 4 paragraph 4); Lepez teaches that the mixing and heated member is made of metal (Page 5 paragraph 5 through Page 6 paragraph 4); and one would have been motivated to use the combined heating and mixing apparatus as taught by Lepez as the heating and mixing screw taught by Underwood in view of Weismann, because a screw which heats and mixes by utilizing the Joule effect and passing electric current through the screw, provides for a less bulky and onerous system as taught by Lepez. Specifically regarding applicant's argument that the apparatus as taught by Lepez includes plastic and thus could not be operated at high temperatures as required by Underwood, Lepez teaches that the enclosure holding the materials and the mixing and heating member is made of insulating material, "such as plastic" (page 7 paragraph 1); as the insulating

material taught by Lepez is an example and is not limited to plastic, there is nothing disclosed or suggested by Weismann to indicate that the heating and mixing apparatus or screw taught by Lepez could not be used or would not work at higher temperatures; and furthermore to select an appropriate insulation material based on operating conditions would have been obvious and routine to one of ordinary skill in the art at the time the invention was made.

Applicant argues that the references of record do not teach benzoanthracene at levels of at most 20ppb in the liquid smoke as recited in claims 13 and 19. In response to applicant's argument, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation was found in the knowledge generally available to one of ordinary skill in the art. Benzoanthracene was a well-known carcinogen to humans; Underwood teaches of diluting the final condensed product so that it contains less than the accepted levels of known carcinogenic (Column 2 lines 61-65, Column 4 lines 10-21 and 27-40, and Column 9 lines 12-13); thus it would be obvious to one of ordinary skill in the art at the time the invention was made to expect a low content of benzoanthrance as recited by applicant. Further, one would have been motivated to reduce the benzoanthracene and other carcinogenic levels as low as possible without damaging the final product, in order to prevent the product from harming consumers. Furthermore, as admitted by applicant, specification page 3 lines 8-11, the standards at the time the invention was made in Europe require for a maximum quantity of 20ppb of benzoanthracene in liquid smoke, thus one of ordinary skill in the art at the time the invention was made would have been motivated for the liquid smoke to contain less than 20ppb in order to comply with European requirements.

Applicant's arguments filed August 18, 2008 regarding the rejection of claims 5 and 22 under 35 U.S.C. 103(a) as being unpatentable over Underwood et al (US 4876108) in view of the combination of Lepez (FR 2775621) as translated by the USPTO July 2007 and Weissman (US 3012124), further in view of Wistreich et al (US 3875314) have been fully considered but they are not persuasive (Brief pages 17-18).

Applicant argues that the rejection with Wistreich does not remedy the deficiencies of the rejection over Underwood in view of the combination of Lepez and Weismann. Thus, applicant's arguments are not convincing for the same reasons of record that applicant's arguments, regarding the rejection of Underwood in view of the combination of Lepez and Weismann, are not convincing.

Applicant's arguments filed August 18, 2008 regarding the rejection of Claims 1, 17, and 18 under 35 U.S.C. 103(a) as being unpatentable over Gruhl (US 4992404) and Lepez (FR 2775621) as translated by the USPTO July 2007 are not convincing (Brief pages 18-23).

Applicant argues that Gruel does not teach heating between the range of 300-400C with a heated endless screw. Applicant's argument is not convincing as Gruel teaches of heating from 200-800C (Column 2 lines 16-22), which encompasses the range of 300-400C and 300-380C as instantly claimed; Gruel teaches of using a screw conveyor (Column 2 line 16-22); Lepez teaches of using a heated endless screw (page 9 paragraph 2,page 10 paragraph 3 and Figure 2); and one would have been motivated to use the heated endless screw as taught by Lepez because the system provides for a less bulky and onerous system as taught by Lepez.

Applicant argues that the references of record do not teach the organic material as introduced at one end of the screw and recovered at the other end of the screw. Applicant's argument is not convincing as one of ordinary skill in the art at the time the invention was made would expect that Gruel inherently teaches of inserting material to be reacted at the beginning of a reactor, i.e. the screw, and recovering the material at the end of the reactor, i.e. the screw. Furthermore, one would have been motivated to insert the material to be reacted at the beginning of a reactor, i.e. the screw, and

recover the material at the end of the reactor, i.e. the screw, so that the material would be fully reacted.

Applicant argues that Gruel is directed towards producing a catalyst and not a smoked product as claimed. Applicant's argument is not convincing. Although, Gruels primary purpose is to produce a catalyst, the process as taught by Gruel also functions to form a smoke or volatile bi-product as instantly claimed (Column 2 lines 16-26).

Applicant argues that the device as taught by Lepez is not capable of achieving temperatures of 200-800C as taught by Gruel because the process and apparatus taught by Lepez are unrelated to the process and apparatus as taught by Gruel. Applicant's argument is not convincing as both references teach of heating and conveying materials and of using a screw to do so.

Applicant argues that the device as taught by Lepez is limited to drying and roasting of coffee and thus can not be used at elevated temperatures. Applicant's argument is not convincing as it is unclear as to where in the reference Lepez is limited only to drying and roasting of coffee.

Applicant's arguments, see Brief pages 23-24, filed August 18, 2008, with respect to the 35 U.S.C. 103(a) rejection of claim 19 over Gruhl (US 4992404) and Lepez (FR 2775621) as translated by the USPTO July 2007 have been fully considered and are persuasive. The 35 U.S.C. 103(a) rejection of claim 19 over Gruhl (US 4992404) and Lepez (FR 2775621) as translated by the USPTO July 2007 has been withdrawn, as stated above. Specifically, neither Gruel nor Lepez disclose a benzoanthracene level of 20ppb or less.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kelly Bekker/

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QAS, TC1700